Kansas Department of
Health and Environment

2005

Air Emissions Inventory
&
Fee Forms Guidance

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1. Introduction

In 1993, KDHE adopted two regulations that modified the emission inventory procedures to comply with the requirements of the 1993 Kansas Clean Air Act Amendments. Kansas Administrative Regulation *(K.A.R.) 28-19-210* specifies how actual emissions are to be calculated and *K.A.R. 28-19-202* requires sources to pay annual fees based on actual emissions of regulated pollutants.

Important Information for the 2005 Emissions Inventory:

The emissions fee is **twenty five dollars ($25)** per ton.

We are collecting information on $PM_{2.5}$ and ammonia (NH_3) emissions, where emission factors or other methods are available. Fees will not be collected on $PM_{2.5}$ and ammonia emissions.

Facilities with total hazardous air pollutant (HAP) emissions greater than or equal to 25 tons/year must report all HAP emissions. All other facilities should report emissions of individual HAPs that are 500 pounds or *more* per year from any emissions unit. Emissions of individual HAPs that are *less* than 500 pounds per year from any emissions unit do not need to be reported, unless the total emissions from similar units at the stationary source equal or exceed 2,000 pounds per year. This applies to all Class I facilities, including power plants.

The due date for 2005 emission fees and forms is June 1, 2006.

This guidance package has been prepared to aid sources of air emissions in calculating actual emissions from their facilities.

K.A.R. 28-19-202 requires the owner or operator of each stationary source of air emissions that meets certain guidelines to pay a fee for these emissions. The types of air emissions and the quantity of air emissions for which annual emissions fees are to be assessed are as follows:

(1) Air emissions of 100 tons per year or more of any of the following;

(A) sulfur oxides measured as sulfur dioxide;
(B) particulate matter calculated as PM_{10}, except if no emission factor or approvable method for calculating PM_{10} is available, annual emissions fees will be assessed for total suspended particulate emissions;
(C) nitrogen oxides expressed as nitrogen dioxide; and
(D) total volatile organic compounds;

(2) Air emissions of hazardous air pollutants of any of the following:

(A) 10 tons per year or more of any single hazardous air pollutant; or
(B) 25 tons per year or more of any combination of hazardous air pollutants, whichever is greater.

Actual emissions estimates must include fugitive emissions from federally designated fugitive emissions sources. These sources are listed in *K.A.R. 28-19-200* and repeated in Table 1. Any source belonging to a source category that, as of August 7, 1980, was regulated by any standard promulgated under section 111 (New Source Performance Standards) or 112 (Hazardous Air Pollutants) of the Federal Clean Air Act (42 USC 7401 et seq.) must include fugitive emissions even if the source is not subject to the standard.

The annual emissions fee shall equal the sum of the actual emissions of pollutant or pollutants specified, multiplied by **$25.00 per ton** of emissions, subject to the following limitations:

(1) no pollutant emitted from the stationary source shall be included in the fee calculation more than once;
(2) no emissions in excess of 4,000 tons per year of any single pollutant from any stationary source shall be included in the fee calculation; and
(3) annual emissions fees for a portable emissions unit or stationary source that operates both in Kansas and out-of-state may be calculated only for emissions from the emissions unit or stationary source while operating in Kansas.

TABLE 1. FEDERALLY DESIGNATED FUGITIVE EMISSION SOURCES
1. Coal cleaning plants (with thermal dryers)
2. Kraft pulp mills
3. Portland cement plants
4. Primary zinc smelters
5. Iron and steel mills
6. Primary aluminum ore reduction plants
7. Primary copper smelters
8. Municipal incinerators capable of charging more than 250 tons of refuse per day
9. Hydrofluoric, sulfuric, or nitric acid plants
10. Petroleum refineries
11. Lime plants
12. Phosphate rock processing plants
13. Coke oven batteries
14. Sulfur recovery plants
15. Carbon black plants (furnace process)
16. Primary lead smelters
17. Fuel conversion plants
18. Sintering plants
19. Secondary metal production plants
20. Chemical process plants
21. Fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input
22. Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels
23. Taconite ore processing plants
24. Glass fiber processing plants
25. Charcoal production plants
26. Fossil-fuel-fire steam electric plants of more than 250 million British thermal units per hour heat input
27. Any other stationary source category which, as of August 7, 1980, was regulated by a standard promulgated under Section 111 (New Source Performance Standards) or 112 (Hazardous Air Pollutants) of the federal Clean Air Act (42 USC 7401 et seq.), but only with respect to those air pollutants that have been regulated for that category.

2. Calculation of Actual Emissions

Actual emissions are required to be calculated in the manner that most accurately reflects the actual emissions of each emissions unit using the best available data for that emissions unit under current operating conditions. Where more than one procedure is available, the most accurate should be selected. Where a specific actual emissions calculation procedure is required for any other purpose by the Kansas air quality regulations or 40 CFR Part 75, "Continuous Emissions Monitoring," as promulgated by 58 FR 3590 on January 11, 1993, that calculation procedure is required to be used to calculate actual emissions.

The owner or operator of an emissions source may calculate actual emissions using the following method(s) as appropriate for that specific source:

(1) Approved emission factors,
(2) Data generated by continuous emission monitoring systems,
(3) Material balances,
(4) Any other method specifically approved by the Kansas Department of Health and Environment in writing, specified in a permit issued to the owner or operator by the Department for the particular emission unit or stationary source using such method, or specified in the Kansas air quality regulations for the particular emissions unit or stationary source.
(5) Potential to emit:

A source shall use this method if the emission unit or stationary source fails to qualify for any other method. Potential to emit means the maximum capacity of a stationary source to emit a pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, sorted, or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is federally enforceable. Secondary emissions such as increases in mobile source emissions do not count in determining the potential to emit of a stationary source.

(6) Any combination of the above that most accurately demonstrates actual emissions from each emissions unit.

A. Emission Factor Method

Actual emissions determined using emission factors are calculated using the following formula:

Actual emissions = OR x EF (1 - (CExCDE))*

Where:

OR = the operating rate as documented through records kept at the emissions unit or stationary source. If insufficient records are kept to determine the actual operating rate of the emissions unit or stationary source during the reporting period, the operating rate shall be determined using the maximum operating capacity during the known hours of operation. If the known hours of operation cannot be determined, the hours of operation shall be the maximum number of hours the facility is permitted to operate during the reporting period.

EF = an appropriate emission factor obtained from AP-42 Compilation of Air Pollution Emission Factors, published by the United States Environmental Protection Agency Office of Air Quality Planning and Standards, or other emission factor approved by the KDHE.

CE = Capture efficiency, the amount of an air contaminant emitted from an emissions unit directed to an air emissions control device divided by the total emissions of the air contaminant from the emissions unit expressed as a two-decimal number between 0.00 and 1.00. Capture efficiency of the control device emissions collection system must be determined using the procedures in *K.A.R. 28-19-210(f)* as summarized in this guideline or as otherwise approved by KDHE.

CDE = control device efficiency determined according to the rules listed below or through performance testing.

*This formula assumes a single overall control efficiency has been developed for situations where emissions are controlled by a series of air emissions control devices. If a single overall efficiency has not been developed, actual emissions shall be calculated as follows:

Actual emissions = OR x EF x (1 - (CExCDE))$_{D1}$ x (1-(CExCDE))$_{D2}$ x ... (1-(CexCDE))$_{Dn}$

Where D is an emissions control device (or devices) for which an overall control efficiency is available, and n is the number of the device in series.

Calculation of credits for actual emission reductions due to air emission control equipment capture efficiencies and control device efficiencies shall follow these procedures:

(1) All emissions during startup, shutdown, control equipment malfunctions or bypasses, or other periods of greater than normal emissions, shall be calculated as if the emissions unit or stationary source was being operated without air emission control equipment unless a more accurate manner of calculating actual emissions is demonstrated by the owner or operator and approved by the department.

(2) Unless otherwise specifically approved in writing by KDHE or stated in an air quality permit issued by the Department for the emissions unit or stationary source, the following air emission control equipment control device efficiencies shall be used when calculating actual emissions:

(A) Particulate matter: In the absence of information to the contrary, all particulate matter emissions from any control equipment shall be assumed to be PM_{10}.

(i) electrostatic precipitator or baghouse	0.90
(ii) high energy wet scrubber	0.80
(iii) low energy wet scrubber	0.70
(iv) cyclonic separator	0.50

(B) Acid gases:

(i) wet scrubber	0.90
(ii) dry scrubber	0.70

(C) Volatile organic compounds:

(i) incinerator (operating at 1400^{o} Fahrenheit or greater)	0.98
(ii) carbon adsorber	0.95

(3) Unless otherwise approved by KDHE or stated in an air quality permit issued by the Department for the emissions unit or stationary source, the following air emission control equipment control device capture efficiencies shall be used when calculating actual emissions:

(A) The capture efficiency for a totally enclosed emissions collection system operating under negative pressure shall be 1.00.
(B) The capture efficiency for an emissions collection system which is not totally enclosed or which is not operated under negative pressure shall be 0.50.

(4) Capture efficiencies and control device efficiencies for other types of air emission control equipment not listed will be determined by the Department on a case by case basis and based upon an appropriate demonstration by the owner or operator of the air emission control equipment.
(5) Other capture efficiencies and control device efficiencies may be approved by the Department upon an appropriate demonstration by the owner or operator of the air emission control equipment.
(6) Each owner or operator who uses an air emission control equipment capture efficiency or control device efficiency, or both, when calculating actual emissions

shall maintain the air emission control equipment in accordance with any applicable Kansas air quality regulations, permit requirements, or manufacturer's recommendations. Beginning January 1, 1994, the owner or operator shall also keep a written log recording the date and type of action taken when performing preventive or other maintenance on the air emission control equipment. Failure of the owner or operator to maintain the air emission control equipment or to keep a written record as required may be considered a control equipment malfunction.

B. Continuous Emission Monitoring Method

Data generated by continuous emission monitoring systems may be used to calculate actual emissions for any emissions unit if the following requirements are met:

(1) For sources subject to 40 CFR part 75, "Continuous Emission Monitoring," actual emissions shall be calculated as required by 40 CFR part 75.

(2) For sources not subject to 40 CFR part 75, the owner or operator shall:

(A) Obtain approval from the KDHE prior to using data generated by a continuous monitoring system for the purpose of calculating actual emissions.
(B) Develop and follow written quality assurance procedure for the continuous monitoring system that is appropriate as determined by the Department.
(C) Submit the data in a format approved by the Department.

(3) For sources not subject to 40 CFR part 75, actual emissions during periods of missing data shall be calculated as follows:

(A) For periods of missing data of one hour or less, data for the hour immediately preceding the missing data and data for the hour immediately following the missing data shall be averaged and submitted to the Department as actual emissions for the missing data. Periods of operation of less than one hour between periods of missing data shall be included as part of the period of missing data.
(B) For periods of missing data of more than one hour but equal to or less than 24 consecutive hours, actual emissions reported to the Department shall be the greater of:

(i) The data determined by the method specified in 40 CFR part 75; or
(ii) The average of the actual emission data for the applicable reporting time period during which the continuous monitoring system was properly operating.

(C) For periods of missing data of more than 24 consecutive hours, actual emissions shall be determined using other appropriate actual emissions calculations methods.
(D) For periods during upsets, startup, shutdown, control equipment malfunctions, and other abnormal operating conditions, actual emissions shall be determined using other appropriate calculation methods specified in *K.A.R. 28-19-210*.

C. Material Balance Method

Actual emissions determined by material balances are calculated with the following formulas:

(1) For volatile organic compound emissions:

Actual emissions = (Q_{added} - $Q_{recovered}$) x (1-(CE x CDE))*

(2) For sulfur dioxide emissions:

Actual emissions = (F_{burned} x %S/100 - CF) x (1-(CE x CDE))*

(3) For all other emissions for which a material balance procedure is appropriate:

Actual emissions = (Q_{added} - $Q_{consumed}$ - $Q_{recovered}$) x (1-(CE x CDE)*

Where:

Q_{added} = the total quantity of the regulated substance which enters the process or operation.

$Q_{recovered}$ = the total quantity of the regulated substance recovered for reuse which is not accounted for by the emission control device calculations.

$Q_{consumed}$ = the total quantity of the regulated substance which becomes an integral part of the product.

F_{burned} = the quantity of fuel containing sulfur by weight.

%S = percent sulfur, by weight, in the sulfur containing fuel.

CE = capture efficiency of the control device emissions collection system determined according to the rules listed on pages 5 and 6 or through performance testing.

CDE = control device efficiency determined according to the rules listed on pages 5 and 6 or through performance testing.

CF = a conversion factor of 1.95 for coal and 2.00 for natural gas, oil, and other fuels.

*This formula assumes a single overall control efficiency has been developed for situations where emissions are controlled by a series of air emissions control devices. If a single overall efficiency has not been developed, actual emissions shall be calculated as follows:

Actual emissions = $(Q_{added} - Q_{consumed} - Q_{recovered}) \times (1 - (CE \times CDE))_{D1} \times (1-(CE \times CDE))_{D2} \times \ldots (1-(CE \times CDE))_{Dn}$

Where D is an emissions control device (or devices) for which an overall control efficiency is available and n is the number of the device in series.

3. HAP Fee Schedule Under K.A.R. 28-19-202

HAPs are listed in *K.A.R. 28-19-201* under the definition of "hazardous air pollutant" and have been repeated in Appendix B both in numeric order by Chemical Abstract Services (CAS) Number and in alphabetical order by chemical name. *K.A.R. 28-19-202* requires that fees be assessed for emissions of 10 tons per year or more of any single hazardous air pollutant or emissions of 25 tons per year or more of any combination of hazardous air pollutants.

4. Inventory Forms on KDHE's Internet Site

Emissions inventory forms are available for download in Microsoft Excel and Adobe Acrobat formats on the KDHE Bureau of Air and Radiation Emissions Inventory website. The address is http://www.kdheks.gov/emission/index.html. The Excel version of the inventory form includes emissions and fee calculation formulas for your convenience. If you use the Excel version of the form, you will need to print each worksheet and submit a hardcopy of the completed form with your signature on the cover sheet. **Forms will not be accepted by e-mail.**

5. AP- 42, FIRE and SCC Information

AP-42 and FIRE emission factors and SCCs can be found on the EPA's CHIEF website. The address is http://www.epa.gov/ttn/chief/. For more information, see Appendix D.

6. AP- 42 Series Ordering Information

To order hardcopies of AP-42 publications, contact the U.S. Government Printing Office (GPO) at (202)512-1800.

7. KDHE Bureau of Air and Radiation Contact List

Program Activity	Staff Contacts
Overall Program Management Legislation Program Funding	Clark Duffy Director, Bureau of Air and Radiation (785) 296-6024
Air Operating, Construction & Compliance Section	Vick Cooper Chief, Air Operating, Construction & Compliance Section (785) 296-1561
Air Inventory Section	Tom Gross Chief, Air Monitoring, Inventory, Modeling & Planning Section (785) 296-1692
Emissions Reporting Fee Calculations	Class I Forms & Technical Information: Will Stone (785) 296-6427 Emission Factor, Fee & Form Information: Barb Bangert (785) 296-1582 Emission Factor, Fee & Form Information: Cathy Watson (785) 296-1947

8. Kansas Local Air Agency Contact List and Map

NORTH-CENTRAL DISTRICT-SALINA 785-827-9639
Burnetti, Rick–District Environmental Administrator
Marshall, Stan -- Air Quality

Shawnee County Health Agency 785-291-2456
Graham, Andy-–Environmental Health Specialist II
Piper, Perry—Air Quality

NORTHEAST DISTRICT-LAWRENCE 785-842-4600
Coleman, Julie -- District Environmental Administrator
Simpson, Pat -- Air Quality

Unified Govt. of Wyandotte Co. - Kansas City, KS. Health Department 913-573-6700
Andersen, Bruce -- Air Quality

Johnson County Environmental Department 913-492-0402
Kemper, Cindy – Department Director
Boothe, Mike -- Air Quality Program Manager

NORTHWEST DISTRICT-HAYS 785-625-5663
Wells, Dan -- District Environmental Administrator
Robinson, Richard -- Air Quality

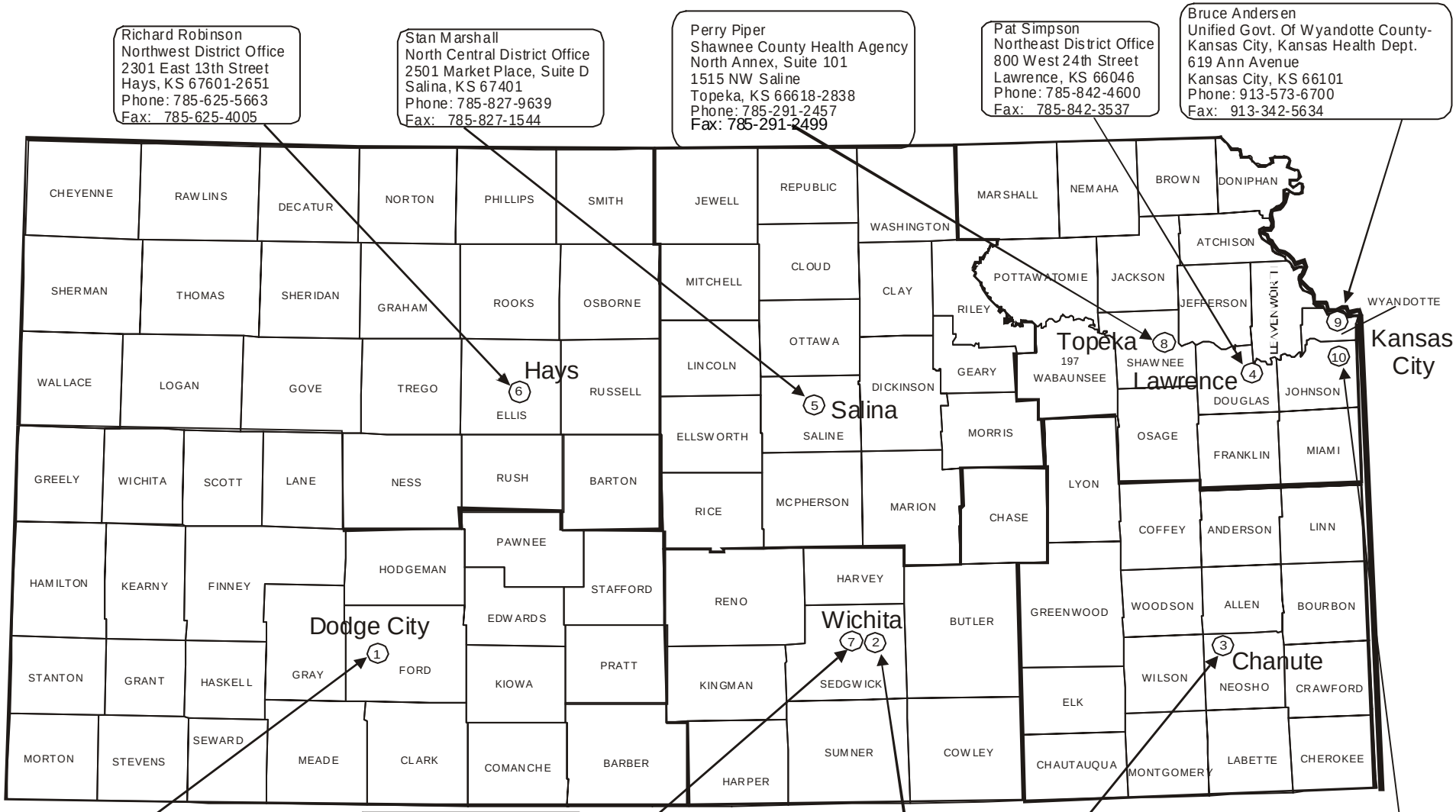
SOUTH-CENTRAL DISTRICT-WICHITA 316-337-6020
Jones, Michael -- District Environmental Administrator
Butler, Dave -- Air Quality

Wichita-Sedgwick County Health Department 316-268-8350
Stark, John -- Air Quality Environmentalist
Owen, Randy--Air Quality

SOUTHEAST DISTRICT-CHANUTE 620-431-2390
Stutt, David -- District Environmental Administrator
Cole, Doug – Air Quality

SOUTHWEST DISTRICT-DODGE CITY 620-225-0596
Guernsey, Allen--District Environmental Administrator
Mies, Don -- Air Quality (316-337-6020)

State of Kansas Department of Health and Environment
Bureau of District Operations Air Program Staff



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